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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,881	07/07/2004	Nobuyuki Hashimoto	01165.0923	8753

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EXAMINER	
RIVERO, MINERVA	
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2627	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No. 10/500,881	Applicant(s) HASHIMOTO, NOBUYUKI
	Examiner Minerva Rivero	Art Unit 2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-61* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-61* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 July 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-61 are rejected under 35 U.S.C. 102(b) as being anticipated by Ootaki *et al.* (US Patent 6,078,554).

4. Regarding claims 1 and 30 Ootaki *et al.* disclose an optical element and optical apparatus having a light source, an objective lens for focusing a light beam from said

light source onto a medium, and a tracking means for moving said objective lens to follow the track of said medium, said liquid crystal optical element comprising:

a first transparent substrate (*glass substrates*, Col. 5, Lines 33-36, see Fig. 2);

a second transparent substrate (*glass substrates*, Col. 5, Lines 33-36, see Fig. 2);

a liquid crystal sealed between said first and second transparent substrates (*liquid crystal molecules between glass substrates*, Col. 5, Liens 33-36, see Fig. 2); and

an electrode pattern as a region for advancing or delaying the phase of said light beam and correcting wavefront aberration (Col. 5, Lines 43-46; *opposite-directional phase difference*, Col. 8, Lines 57-64; *appropriate phase differences*, Col. 9, Lines 43-52), wherein

said region is formed smaller than the field of view of said objective lens so that said region substantially stays within the field of view of said objective lens regardless of the tracking motion of said tracking means (*see electrode patterns with respect to objective lens 5 in* Fig. 4; see electrode patterns 312b3 and 312b4 in Fig. 19).

5. Regarding claims 2 and 31, Ootaki *et al.* disclose a liquid crystal element and optical apparatus wherein said electrode pattern is a coma aberration correcting electrode pattern, and said region has a first region for advancing the phase of said light beam and second region for delaying the phase of said light beam (*appropriate phase differences*, Col. 9, Lines 43-52; *opposite-directional phase difference*, Col. 8, Lines 57-64; *comatic aberration*, Col. 6, Lines 33-36).

6. Regarding claims 3 and 32, Ootaki *et al.* disclose said electrode pattern has a third region that does not substantially change the phase of said light beam (Col. 9, Lines 29-38, see electrode patterns in Fig. 4 B, and correspondent phase compensation in Fig. 8 (*dotted line which includes a span of zero phase compensation*)).

7. Regarding claims 4 and 33, Ootaki *et al.* disclose said region has only one said first region and one said second region (Col. 9, Lines 43-52; *divided-by-3 electrode pattern*, see Figs. 4A, 9 and 14).

8. Regarding claims 5 and 34, Ootaki *et al.* disclose said region has two of said first regions and two of said second regions (*divided-by-5*, Col. 10, Line 66 – Col. 11, Line 3, see Fig. 4B).

9. Regarding claims 6 and 35, Ootaki *et al.* suggest said first and second regions together are formed smaller than and 50 μm to 300 μm inwardly of, the field of view of said objective lens when said tracking means is in a non-operating condition (*see electrode patterns with respect to objective lens 5 in* Fig. 4; see electrode patterns 312b3 and 312b4 in Fig. 19; see Fig. 20).

10. Regarding claims 7 and 36, Ootaki *et al.* disclose said first and second regions together are formed smaller than, and inwardly of, the field of view of said objective lens so that residual coma aberration of said light beam after said aberration correction is

kept within λ/4, where λ is the wavelength of said light beam, when said tracking means is in a non-operating condition (see resulting wavefront aberration in Fig. 18B after compensation was applied as shown in Fig. 18A, residual aberration is less than approximately 50 nm in all cases; wavefront aberration is comprised of *spherical aberration*, Col. 9, Line 44; and *comatic aberration*, Col. 6, Lines 33-36).

11. Regarding claims 8 and 37, Ootaki *et al.* disclose said first and second regions together are formed smaller than, and inwardly of, the field of view of said objective lens so that residual coma aberration of said light beam after said aberration correction is kept within λ/14, where λ is the wavelength of said light beam, when said tracking means is in a non-operating condition (see resulting wavefront aberration in Fig. 18B after compensation was applied as shown in Fig. 18A, residual aberration ranges from 0 nm to less than approximately 50 nm; wavefront aberration is comprised of *spherical aberration*, Col. 9, Line 44; and *comatic aberration*, Col. 6, Lines 33-36).

12. Regarding claims 9 and 38, Ootaki *et al.* disclose said first and second regions together are formed smaller than, and inwardly of, the field of view of said objective lens so that residual coma aberration of said light beam after said aberration correction is kept within 33 mλ, where λ is the wavelength of said light beam, when said tracking means is in a non-operating condition (see resulting wavefront aberration in Fig. 18B after compensation was applied as shown in Fig. 18A, residual aberration ranges from 0

nm to less than approximately 50 nm; wavefront aberration is comprised of *spherical aberration*, Col. 9, Line 44; and *comatic aberration*, Col. 6, Lines 33-36).

13. Regarding claims 10 and 39, Ootaki *et al.* disclose said electrode pattern is a spherical aberration correcting electrode pattern, and said region has a plurality of subregions for advancing or delaying the phase of said light beam (*spherical aberration*, Col. 9, Line 44; *appropriate phase differences*, Col. 9, Lines 43-52; *opposite-directional phase difference*, Col. 8, Lines 57-64; *comatic aberration*, Col. 6, Lines 33-36).

14. Regarding claims 11 and 40, Ootaki *et al.* suggest said first and second regions together are formed smaller than and 50 μm to 300 μm inwardly of, the field of view of said objective lens when said tracking means is in a non-operating condition (*see electrode patterns with respect to objective lens 5 in* Fig. 4; see electrode patterns 312b3 and 312b4 in Fig. 19; see Fig. 20).

15. Regarding claims 12 and 41, disclose said plurality of subregions are formed only in an inside region smaller than an effective diameter of said objective lens so that residual spherical aberration of said light beam after said aberration correction is kept within $\lambda/4$, where λ is the wavelength of said light beam, when said tracking means is in a non-operating condition (see resulting wavefront aberration in Fig. 18B after compensation was applied as shown in Fig. 18A, residual aberration ranges from 0 nm

to less than approximately 50 nm; wavefront aberration is comprised of *spherical aberration*, Col. 9, Line 44; and *comatic aberration*, Col. 6, Lines 33).

16. Regarding claims 13 and 42, Ootaki *et al.* disclose said plurality of subregions are formed smaller than, and inwardly of, the field of view of said objective lens so that residual spherical aberration of said light beam after said aberration correction is kept within λ/14, where λ is the wavelength of said light beam, when said tracking means is in a non-operating condition (see resulting wavefront aberration in Fig. 18B after compensation was applied as shown in Fig. 18A, residual aberration ranges from 0 nm to less than approximately 50 nm; wavefront aberration is comprised of *spherical aberration*, Col. 9, Line 44; and *comatic aberration*, Col. 6, Lines 33).

17. Regarding claims 14 and 43, Ootaki *et al.* disclose said first and second regions together are formed smaller than, and inwardly of, the field of view of said objective lens so that residual spherical aberration of said light beam after said aberration correction is kept within 33 mλ, where λ is the wavelength of said light beam, when said tracking means is in a non-operating condition (see resulting wavefront aberration in Fig. 18B after compensation was applied as shown in Fig. 18A, residual aberration ranges from 0 nm to less than approximately 50 nm; wavefront aberration is comprised of *spherical aberration*, Col. 9, Line 44; and *comatic aberration*, Col. 6, Lines 33-36).

18. Regarding claims 15 and 46, Ootaki *et al.* disclose said electrode pattern includes a coma aberration correcting electrode pattern formed on either one of said first and second transparent substrates and a spherical aberration correcting electrode pattern formed on the other one of said first and second transparent substrates (Col. 5, Lines 43-46; *spherical aberration*, Col. 9, Line 44; and *comatic aberration*, Col. 6, Lines 33-36).

19. Regarding claims 16 and 47, Ootaki *et al.* disclose said region for coma aberration correcting electrode pattern has a first region for advancing the phase of said light beam and a second region for delaying the phase of said light beam (Col. 9, Lines 29-38, see electrode patterns in Fig. 4 B, and correspondent phase compensation in Fig. 8 (*dotted line which includes a spans of advancing and delaying a phase*)).

20. Regarding claims 17 and 48, Ootaki *et al.* disclose said coma aberration correcting electrode pattern has a third region that does not substantially change the phase of said light beam (Col. 9, Lines 29-38, see electrode patterns in Fig. 4 B, and correspondent phase compensation in Fig. 8 (*dotted line which includes a span of zero phase compensation*)).

21. Regarding claims 18 and 49, Ootaki *et al.* suggest said first and second regions together are formed smaller than, and 80 μm to 500 μm inwardly of, the field of view of said objective lens when said tracking means is in a non-operating condition (*see*

electrode patterns with respect to objective lens 5 in Fig. 4; see electrode patterns 312b3 and 312b4 in Fig. 19; see Fig. 20).

22. Regarding claims 19 and 50, Ootaki *et al.* disclose said first and second regions together are formed smaller than, and inwardly of, the field of view of said objective lens so that residual coma aberration of said light beam after said aberration correction is kept within λ/4, where λ is the wavelength of said light beam, when said tracking means is in a non-operating condition (see resulting wavefront aberration in Fig. 18B after compensation was applied as shown in Fig. 18A, residual aberration ranges from 0 nm to less than approximately 50 nm; wavefront aberration is comprised of *spherical aberration*, Col. 9, Line 44; and *comatic aberration*, Col. 6, Lines 33).

23. Regarding claims 20 and 51, Ootaki *et al.* disclose said first and second regions together are formed smaller than, and inwardly of, the field of view of said objective lens so that residual coma aberration of said light beam after said aberration correction is kept within λ/14, where λ is the wavelength of said light beam, when said tracking means is in a non-operating condition (see resulting wavefront aberration in Fig. 18B after compensation was applied as shown in Fig. 18A, residual aberration ranges from 0 nm to less than approximately 50 nm; wavefront aberration is comprised of *spherical aberration*, Col. 9, Line 44; and *comatic aberration*, Col. 6, Lines 33).

24. Regarding claims 21 and 52, Ootaki *et al.* disclose said first and second regions together are formed smaller than, and inwardly of, the field of view of said objective lens so that residual coma aberration of said light beam after said aberration correction is kept within 33 mλ, where λ is the wavelength of said light beam, when said tracking means is in a non-operating condition (see resulting wavefront aberration in Fig. 18B after compensation was applied as shown in Fig. 18A, residual aberration ranges from 0 nm to less than approximately 50 nm; wavefront aberration is comprised of *spherical aberration*, Col. 9, Line 44; and *comatic aberration*, Col. 6, Lines 33).

25. Regarding claims 22 and 53, Ootaki *et al.* disclose said region for said spherical aberration correcting electrode pattern has a plurality of subregions for advancing or delaying the phase of said light beam ((Col. 9, Lines 29-38, see electrode patterns in Fig. 4 B, and correspondent phase compensation in Fig. 8 (*dotted line which includes a spans of advancing and delaying a phase*)).

26. Regarding claims 23 and 54, Ootaki *et al.* suggest said first and second regions together are formed smaller than, and 70 μm to 400 μm inwardly of, the field of view of said objective lens when said tracking means is in a non-operating condition (*see electrode patterns with respect to objective lens 5 in* Fig. 4; see electrode patterns 312b3 and 312b4 in Fig. 19; see Fig. 20).

27. Regarding claims 24 and 55, Ootaki *et al.* disclose said first and second regions together are formed smaller than, and inwardly of, the field of view of said objective lens so that residual spherical aberration of said light beam after said aberration correction is kept within λ/4, where λ is the wavelength of said light beam, when said tracking means is in a non-operating condition (see resulting wavefront aberration in Fig. 18B after compensation was applied as shown in Fig. 18A, residual aberration ranges from 0 nm to less than approximately 50 nm; wavefront aberration is comprised of *spherical aberration*, Col. 9, Line 44; and *comatic aberration*, Col. 6, Lines 33).

28. Regarding claims 25 and 56, Ootaki *et al.* disclose said first and second regions together are formed smaller than, and inwardly of, the field of view of said objective lens so that residual spherical aberration of said light beam after said aberration correction is kept within λ/14, where λ is the wavelength of said light beam, when said tracking means is in a non-operating condition (see resulting wavefront aberration in Fig. 18B after compensation was applied as shown in Fig. 18A, residual aberration ranges from 0 nm to less than approximately 50 nm; wavefront aberration is comprised of *spherical aberration*, Col. 9, Line 44; and *comatic aberration*, Col. 6, Lines 33).

29. Regarding claims 26 and 57, Ootaki *et al.* disclose said first and second regions together are formed smaller than, and inwardly of, the field of view of said objective lens so that residual coma aberration of said light beam after said aberration correction is kept within 33 mλ, where λ is the wavelength of said light beam, when said tracking

means is in a non-operating condition (see resulting wavefront aberration in Fig. 18B after compensation was applied as shown in Fig. 18A, residual aberration ranges from 0 nm to less than approximately 50 nm; wavefront aberration is comprised of *spherical aberration*, Col. 9, Line 44; and *comatic aberration*, Col. 6, Lines 33).

30. Regarding claim 58,Ootaki *et al.* disclose a switching means for switching operation between said coma aberration correcting electrode pattern and said spherical aberration correcting electrode pattern according to said recording medium used (Col. 14, Lines 38-46).

31. Regarding claims 27 and 59, Ootaki *et al.* disclose said coma aberration correcting electrode pattern is used for a DVD (Col. 2, Lines 13-21).

32. Regarding claims 28 and 60, Ootaki *et al.* disclose said spherical correcting electrode pattern is used for a CD (Col. 2, Lines 13-21).

33. Regarding claims 29 and 61, Ootaki *et al.* disclose said objective lens is an objective lens for a DVD (Col. 7, Lines 30-35; Col. 4, Lines 46-59).

34. Regarding claim 44, Ootaki *et al.* disclose a voltage applying means for applying a voltage to said spherical aberration correcting electrode pattern according to generated spherical aberration (Col. 6, Lines 46-50).

35. Regarding claim 46, Ootaki *et al.* disclose said recording medium has a plurality of track surfaces (CD or DVD selection signal, Col. 6, Lines 59-64), and said optical apparatus further comprises a voltage applying means for activating said spherical aberration correcting electrode pattern according to said plurality of track surfaces (Col. 6, Lines 59-64).

Conclusion

36. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kobayashi *et al.* (US 2005/0237880) disclose an optical disk recording apparatus and aberration adjustment method.

Hirai (US 2005/0270955) discloses an optical pickup unit that includes a spherical aberration correction unit.

Ogasawara (US 6,141,304) discloses an optical pickup including a wavefront aberration correcting device.

Stallinga *et al.* (US 2003/0035356) disclose an optical wavefront modifier.

Kobayashi (US 2005/0237881) disclose a method for adjusting an aberration in an optical disc recording apparatus.

37. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minerva Rivero whose telephone number is (571) 272-7626. The examiner can normally be reached on Monday-Friday 9:00 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571) 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MR 5/15/06

WAYNE YOUNG
SUPERVISORY PATENT EXAMINER